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PREPARATORY COMMITTEE FOR THE
UNITED NATIONS CONFERENCE ON
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Item 2 (c) of the provisional agenda

PREPARATIONS FOR THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT ON THE BASIS OF GENERAL ASSEMBLY RESOLUTION 44/228 AND TAKING INTO ACCOUNT OTHER RELEVANT GENERAL ASSEMBLY RESOLUTIONS:

CROSS-SECTORAL ISSUES

Progress Report on Environment and Development

Report of the Secretary-General of the Conference

INTRODUCTION

1. The Preparatory Committee for the United Nations Conference on Environment and Development, in decision 1/25 of its first substantive session, requested the Secretariat to submit at its second substantive session a progress report underlining the close relationship between development and environment, in accordance with General Assembly resolution 44/228 of 22 December 1989 and other relevant United Nations resolutions and taking due account of the provisions of the Declaration on International Economic Co-operation, in particular the Revitalization of Economic Growth and Development of Developing Countries as well as the preparations of the International Development Strategy for the Fourth United Nations Development Decade.

2. This progress report also covers Preparatory Committee decision 1/28 on cross-sectoral issues, in particular paragraphs (c) and (d) which request the Secretary-General of UNCED to undertake specific studies on the relationship between economic and environmental policies and the need to harmonize developmental objectives and sustainability and environmental concerns without adding new forms of conditionality or unjustified barriers to trade.

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3. The Secretariat has initiated a wide-ranging programme of work which will enable it to address these issues in-depth. This progress report describes the issues being considered and the process of work which has been set up for this purpose.

THE MAJOR ISSUES

The International Development Strategy for the Fourth United Nations Development Decade which was approved by the General Assembly recently has put before the global community six interrelated goals. They are:

(a) A surge in the pace of economic growth in the developing countries;

(b) A development process which is responsive to social needs, seeks a significant reduction in extreme poverty, promotes the development and utilization of human resources and skills and is environmentally sound and sustainable;

(c) An improvement of the international systems of money, finance and trade so as to support the development process;

(d) A setting of strength and stability in the world economy and sound macro-economic management, nationally and internationally;

(e) A decisive strengthening of international development co-operation;

(f) A special effort to deal with the problems of the least developed countries, the weakest among the developing countries.

These goals, as also the policies and measures identified in the International Development Strategy for the reactivation of development and for addressing the priority aspects of development form the context within which linkages between environment and development will be examined. In particular, it is worth noting that the International Development Strategy has, as priority aspects of development, the following:

1. Eradication of poverty and hunger;

2. Human resource and institutional development;

3. Population;

4. Environment.

The major issues being considered in the work programme of the Secretariat on environment and development are described below:

The relationship between poverty, lack of growth and environmental degradation

Environmental degradation in development countries hurts the poor principally through the erosion of their livelihood base. Primary production accounts for a much larger proportion of income-generation in developing countries, particularly in those which are least developed. When land and water resources deteriorate or fishstocks are depleted or forests denuded, the livelihood base available to poor households shrinks. Apart from this the

poor are more vulnerable to the deterioration in air and water quality both in rural and in urban areas since they tend to live in the most congested and most exposed locations. In this sense, environmental degradation reinforces poverty particularly the poverty which arises from lack of adequate development.

In the reverse direction, widespread poverty leads to environmental pressures in a variety of ways. Low productivity of resource use, particularly of land, increases the pressures to expand cultivation into inappropriate areas, particularly if the rate of population growth is high. Poverty often compels households to take a short-term view and over exploit natural resources, like forests, to meet their immediate needs even if it means greater pressures on consumption standards in the longer term.

Thus both poverty and certain types of environmental degradation have their roots in the lack of development. Hence, the answers have to be sought in an acceleration of development but with a renewed emphasis on equity and sustainable resource use.

The Secretariat invites the views of the Preparatory Committee on a preliminary report entitled "Links between Poverty and Environmental Degradation" (A/CONF.151/PC/15) which is before this session of the Preparatory Committee for consideration. On the basis of this guidance, as also the further work outlined in the report, a further paper will be presented for the consideration of the Preparatory Committee.

The relationship between demographic developments, economic growth, unsustainable consumption patterns and environmental degradation

The pressure of human activities impinges on the environment essentially through the use that humans make of the environment for meeting their consumption needs. These demands on the environment are a function of per capita consumption standards and the number of people. There are, at present, great inequalities in the resource intensity of consumption in different parts of the world. There are also great variations in demographic developments. In order to understand the links between growth and environmental degradation both of these dimensions need to be looked at simultaneously and that too, in the context of technological developments and policy orientations which help or hinder efficiency of resource use. This particular dimension of the environment-development link is amenable to quantitative analysis. However, the major issues that need to be examined are not just the quantitative dimensions, but the policy implications. The Secretariat has initiated a work process to study these linkages and will present its analysis to the Preparatory Committee.

The relationship between the international economy and the degradation of the environment

Financial and economic stringency resulting from adverse movements in the terms of trade and the net transfer of financial resources from developing to developed economies influences sustainable development through a variety of routes. A common element, however, is the shortening of time horizons and the apparent premium that is created for policies and business decisions that generate cash flow in the short run, and policies that help protect current consumption from falling. Adverse movements in the terms of trade and the

external debt problem and its associated phenomenon, the negative net transfer of resources both reduce the real resources available to the economy. In the case of an adverse movement of the terms of trade, this occurs because of a reduction in the external purchasing power of domestic output; in the case of a negative net transfer of resources it occurs because the totality of outward financial payments required because of past financial transactions exceeds the inward flow of finance resulting from current financial transactions. The manner in which this impacts on the domestic economy will depend on how it influences current consumption and investment. Experience with such phenomena during the past decade suggests that consumption in developing countries is a function of current domestic output as well as of the economy's purchasing power and access to foreign markets. The fall in real resources therefore have a direct impact on both domestic consumption and private and public investment levels. This situation in many cases renders incompatible the capacity to meet the needs of the present and the capacity to do so without compromising the ability of future generations to meet theirs. In such a situation disinvestment of one sort or another occurs, with the result that the maintenance, rational use and enhancement of the natural resource base does not take place.

The increased incentives to solve immediate problems at the expense of future generations may be one of the less evident consequences of the economic crisis facing many developing countries. It may also be one of the more long-lasting. In order to enable developing countries to pursue a sustainable pattern of development it is imperative to secure sustainable levels of current consumption and levels of domestic investment which guarantee employment and create new sources of future income.

The Secretariat has initiated a work process on this area and will present the results of its analysis to the Preparatory Committee.

Further to the General Assembly resolution on environment and international trade adopted at its forty-fifth session (A/C.2/45/L.95 and amendments), UNCED will also be co-operating with UNCTAD in the preparation of an analytic study on the present situation and future trends regarding the relationship between environmental issues and international trade taking due account of decision 384 of UNCTAD Trade and Development Board.

Economics and social conditions, economic instruments and market mechanisms

The institutional basis for economic activity plays a very important role in mediating the relationship between environment and development. The role of private property, the way in which the public interest is articulated and enforced, the strength of community institutions, legal arrangements for enforcement of liability, the role of the market mechanism in the allocation and use of resources and the effectiveness of the administrative infrastructure are but some of the factors that are relevant in this context. The policy framework for environmental management and the promotion of development has to take into account these factors. In particular, the link between economic decisions and environmental impact opens the possibility of using economic instruments and the market mechanism for environmental management at the national, regional or global level. The mix between regulatory measures and such indirect management through economic instruments may vary from problem to problem and country to country. The Secretariat proposes to examine these issues both in a general context, as also in the context of the specific problems being addressed in the sectoral issues.

PROGRAMME OF WORK

The programme of work for the consideration of the issues outlined in the previous section involves the full utilization of relevant inputs from the United Nations system and special studies undertaken specifically for the 1992 Conference.

Inputs from the United Nations system

Virtually all the work being done on environmental and developmental monitoring in the United Nations system is relevant for the Secretariat's work programme in this area. Analytical studies and evaluations of development strategy, international economic conditions, the human dimension of development, social and institutional conditions in their relation to environmental management and development are but some of the areas of work in the United Nations system which are relevant for this particular area of work. The Secretariat will utilize fully all such inputs from the United Nations system. Listed below are certain inputs which are more specifically directed at the issues being studied by the Secretariat as part of its work programme to follow-up the resolution 1/25 of the first substantive session of the Preparatory Committee:

1. UN/DIESA: DIESA proposes to undertake studies analysing the interaction and reconciliation between the need for rapid social and economic development and the avoidance of environmental degradation. With regard to policy modelling of environmental and resource issues, the global input/output model of the world economy will be the major scientific tool used by DIESA for analysing and projecting future interactions between environment and development. The population division of DIESA proposes to undertake studies to provide a deeper and clearer understanding of the complex relationships of population change to social and economic development vis-à-vis resource and environmental concerns. The Statistical Office of the United Nations Secretariat proposes to undertake further work on environmental statistics in environmental accounting to determine a revised and so up-to-date guidelines can be provided. All of these studies undertaken by UN/DIESA will be of great value in the work programme of the Secretariat on environment and development.

2. World Bank: The World Bank's "World Development Report" for 1992 will be on Environment and Development. The work programme for the preparation of this World Development Report includes a large number of background papers and studies. The Secretariat has established links with the team working on this report and will utilize the studies that are available in time. In addition to this, the policy reviews, evaluations and working papers, prepared in a large number of areas by the World Bank, will be of assistance in this work. Some more specific work by the World Bank in relation to the theme of poverty and environmental degradation is described below under item 5.

3. UNFPA: Ongoing UNFPA activities focus on four major fronts: (i) the development of methodologies to gauge interrelations between population, technological and environmental factors; (ii) assistance in the formulation of national conservation strategies through analysis of relevant linkages between population variables; (iii) funding of public-awareness activities involving seminars, training of planners and formal education; and (iv) identification of new ways of reaching population subgroups where poverty, environmental

degradation, and rapid population growth are resulting in ecologically-endangered zones. The Secretariat will be utilizing UNFPA experience and data in the analyses of linkages between environment and development.

4. UNCTAD: UNCTAD's activities in this area will be focused initially on exploring the interface between poverty reduction and policies and mechanisms in environmentally sensitive sectors. A first step in this exploration would be a thorough review of the likely consequences for the trade of developing countries of the systematic application of the polluter-pays principle. UNCTAD will also adjust its Trade Control Measures Information System to monitor environmental regulations for possible protectionism and to monitor non-tariff measures which have a bearing on the environment.

5. Poverty - Studies: The Secretariat has initiated the analysis of several aspects of the relationship between poverty and environmental degradation (refer to document A/CONF.151/PC/15). Further to discussions with concerned agencies of the United Nations system a further work programme was identified with a view to refine the analysis and develop proposals for consideration by the Preparatory Committee. In addition to sector specific work being undertaken by several agencies the Secretariat will be focusing its work on actions required for the promotion of sustainable livelihoods for all, particularly in the areas subject to environmental stress, as well as on the means to achieve this objective taking into account implications in regards to demographic, health, housing and educational policies.

The Secretariat is maintaining contact with other concerned developmental agencies in the United Nations system in order to develop effective links with other areas of work which could help in addressing the issues raised with regard to the linkages between environment and development in General Assembly resolution 44/228 and in the decisions of the Preparatory Committee.

Special Studies

In addition to the inputs which would be available from the United Nations system, the Secretariat expects to receive significant inputs from studies undertaken specifically for the 1992 Conference. These studies are described below:

1. Study on Sustainable Development

The UNCED has taken the initiative in collaboration with UNDP and with the support of UNCTAD to launch a study process leading to a symposium and a report on "Sustainable Development: From Concept to Action." The major purpose of this exercise is to operationalize the concept of sustainable development. The study will pay particular attention to the instruments and institutions which need to be developed for the integration of environmental criteria in economic decisions and in development programmes. This project should provide substantive inputs to the discussions at the Preparatory Committee on Environment and Economic Development. The substantive work for this project will be closely integrated with the overall work programme of the Secretariat, but it will be carried out as a distinctive and autonomous process within this work programme. The expected agenda for this study is given in Annex I.

The project originally initiated by the World Federation of United Nations Associations is being financed with extra-budgetary contributions from the Government of Netherlands and UNDP. Significant substantive contributions are envisaged from concerned organizations in the United Nations system, particularly UNCTAD, UN/DIESA and UNU/WIDER.

2. Study on Linkages

In an independent study, also initiated by the World Federation of United Nations Associations and which is being conducted in close collaboration with the Secretariat, the International Institute for Applied System Analysis in Austria is undertaking a project on environment and development which will contribute significantly to the work requested to the UNCED Secretariat. This project will use system analysis to examine some linkages between human development (in terms of relations between population size and structure, lifestyle/living standards and production systems, etc.), the demands and stresses these place on the environment (in terms of resource requirements, waste disposal, toxification, acidification, climate change, etc.) and the effect of particular types of stress on specific life-supporting environmental cycles, systems and processes. These linkages will be examined in several case studies to afford an understanding of relevant linkages in both developing and developed countries.

3. Studies on development-environment linkages

In order to have a broad based perspective on the relationship between unsustainable consumption patterns both in developing and developed countries, population dynamics, the non-realization of economic potentials in some countries and the effect on the use of natural resources at national and global levels, the Secretariat has sought the expertise of renowned research institutions world-wide. In order to prepare a consolidated reference document which could add quantitative substance to the discussion of sustainable patterns of development and suggest options for public policy, the Secretariat has commissioned studies on these issues from the following institutions in developing and developed countries: the Indira Gandhi Institute of Development Research, India, the Catholic University of Rio de Janeiro, Brazil, the Institute of World Economy and International Relations, USSR, the Ecological Systems Analysis Group of the Bariloche Foundation, Argentina. In addition, the Secretariat has sought inputs from the World Resources Institute on this matter. Papers are being prepared at these institutions with a view to consider regional, subregional and national experiences with development policy-making taking into account relevant specificities of selected groups of countries.

ANNEX I

Sustainable development: from concept to action

1. Sustainable development:

(a) state of the concept;

(b) linkages with environmental economics and development studies.

2. Efficiency and equity in resource use:

(a) transition to more sustainable and replicable patterns of production and consumption, particularly in the North;

(b) accelerating sustainable growth in the South;

(c) implications for trade and international economic relations: the North-South dimension.

3. Development in the South: a condition for environmental management:

(a) poverty alleviation and economic policies for sustainable natural resource use;

(b) human resource development and widening of options;

(c) regional problematiques.

4. Instruments and institutions for sustainable development:

(a) tools for planners;

(b) incentives for entrepreneurs;

(c) pricing of natural resources/costing of environmental damage;

(d) laws and regulations;

(e) social incentives and controls (community control and public participation);

5. International co-operation:

(a) networks for assessment and information on environmentally-sound technologies;

(b) incentives and mechanisms for technological development, diffusion and transfer;

(c) finance for sustainable development: national mobilization, foreign direct investment and transfers of new and additional resources.

6. Steps ahead - Recommendations.

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Progress report on transfer of technology

Report by the Secretary-General of the Conference

I. INTRODUCTION

1. At its first substantive session, the Preparatory Committee, in decision 1/29: Co-operation on transfer of technology and financial resources to developing countries, requested the Secretary-General of the United Nations Conference on Environment and Development to submit a progress report on the implementation of relevant provisions of General Assembly resolution 44/228 related to transfer of technology. 1/

2. The Preparatory Committee, in decision 1/8: Transfer of Technology, also requested the Secretary-General to prepare for consideration by the Preparatory Committee at future sessions a more detailed study. 2/

3. In responding to this request, care has been taken to consider the broader mandate of the Conference and linkages have been established with other work requested by the Preparatory Committee. In a preliminary attempt to respond in an integrated manner to the requests of the various

recommendations of the Preparatory Committee, three major components have been considered, i.e. issues related to technology transfer, capacity building in developing countries, and global science initiatives.

4. In preparing this report, excellent co-operation and documentation was received from relevant organizations in particular the United Nations Environment Programme, the United Nations Development Programme, the United Nations Centre on Transnational Corporations, the United Nations Centre for Science and Technology for Development, the United Nations Conference on Trade and Development, the United Nations Educational, Scientific and Cultural Organization, the United Nations Industrial Development Organization, the World Bank, the International Council of Scientific Unions, as well as the Business Council of Sustainable Development.

II CURRENT ACTIVITIES AND WORK PROCESS

5. Since technological support and assistance is one of the main functions of the United Nations system, almost all parts of the United Nations are involved in technological co-operation in one way or another. Discussion here is focused on examples of some of the specific activities related to environmentally sound technologies. 3/

6. UNEP has been conducting the Cleaner Production Programme in co-operation with other international organizations and industry. The Programme is based on the concept that it is better to avoid environmental problems than to solve them afterwards. This has important implications for technology transfer, not only in ensuring that low waste manufacturing processes become more widely available, but also in looking at the contributions made by improved production design, residue management, energy efficiency, etc.

7. An important part of the programme is the transfer of information regarding environmentally sound technologies. Among others, the International Cleaner Production Information Clearing House (ICPIC), the technical query/response services within IEO (Industry and Environment Office), the training activities on hazardous waste management and on APELL (Awareness and Preparedness for Emergencies at Local Level), and the industrial outreach activities of IEO are involved in such activities.

8. UNESCO, through its Engineering and Technology Division contributes to improved transfer of environmentally sound technologies through:

- improved and appropriately adapted environmentally sound engineering curricula for technical university staff, engineers and higher technicians (in 1992/93 for the countries of Central and Eastern Europe, as well as the African region);

- the development, production and testing of learning packages in the engineering sciences;

- the establishment of production units and the provision of assistance to a number of engineering faculties and technology parks of developing countries (in 1992/93 for countries in Latin America and the Caribbean region);

- the promotion of international and regional co-operation in the area of environmentally sound engineering education and sciences, through the establishment of three regional networks and the creation of an exchange programme for linking East and West European universities.

9. UNCTC has initiated a research project on Options for Facilitating Access by and Transfer to Developing Countries of Environmentally Sound Technologies on Favorable Terms. This project is in response to ECOSOC Resolution 1990/71. The resolution requested examination of the role of the Transnational Corporations (TNCs) and the various mechanisms which can be made available to industry, governments and international organizations to increase the transfer of environmentally sound technologies. The UNCTC Project raises issues and questions that will need to be resolved in any negotiation process to facilitate the transfer of environmentally sound technologies.

10. UNCSTD is undertaking a study on ways and means of ensuring the participation of developing countries in international co-operation for research on and development of environmentally sound technologies, and the rapid and effective transfer of such technologies to those countries. Special emphasis will be given to relevant policy issues and options, namely:

- to explore ways and means to enhance the share of developing countries in international co-operation in research and development;

- to identify creative mechanisms and effective measures for removing existing barriers which hamper the access of developing countries to environmentally sound technologies, and to promote the transfer of such technologies to those countries.

11. In this connection, UNCSTD has recently organized a Workshop on Creative Financing for Environmentally Sound Technologies, held in Belém, Brazil from 2 to 7 December 1990, in collaboration with the Government of Brazil, UNDP, UNFSTD and others. The objectives of the Workshop were to examine new proposals and work out new ideas for mechanisms to finance environmentally sound technologies in developing countries, and to prepare a menu of such financing mechanisms including those already under discussion and assess the potential effectiveness of each mechanism for technologies related to selected international conventions.

12. ICSU is scheduled to convene a Conference on an Agenda of Science for Environment and Development into the 21st Century (ASCEND 21) on 24-29 November 1991, in Vienna, Austria in co-operation with the Third World Academy of Sciences and hosted by the Federal Government of Austria. The Conference will aim to bring together the views of the world's scientific community on the priority issues for the Science Agenda for the next 10-20 years and on the basis of these provide a direct input to the UNCED preparations.

13. The Business Council for Sustainable Development (BCSD) is undertaking a major programme on technological co-operation, one of the main activities in support of the preparatory process for the 1992 Conference. The expected outputs are a series of national workshops in developing regions that will examine in detail, through specific industrial sectors, the mechanisms and techniques used by industry to foster technological co-operation and the constraints encountered and will propose recommendations on what could be

done to overcome these constraints and increase co-operation. The results of the workshops will be analysed and synthesized and a publication, Industry's Perspective on Technology Co-operation for Sustainable Development, will be prepared. It is expected that the first part of the publication will review the present practices and programmes of technology transfer and discuss and illustrate the concepts of technology co-operation in a market context. The second part will present the case studies.

14. The United Kingdom Government has initiated a study on technology transfer relating to climate change. The study will review past experiences, current activities and future prospects on the role of technology transfer in limiting and/or adapting to the growth in GHG emissions, the institutional, governmental, economic and infrastructure considerations which influence the ability of developing countries to absorb, maintain and fully utilize technology transfer, and the institutional ability of developing countries to interpret and adapt to the effect of climate change.

15. The Government of Japan is preparing a paper on capacity building in developing countries, particularly in the areas of environmental monitoring, research and administration based on their experiences of the projects of the Environmental Research and Training Centre in Thailand, the China-Japan Friendship Environmental Conservation Centre, the Environmental Management Centre in Indonesia as well as the proposed Global Environmental Technology Development and Transfer Centre in Japan.

16. The Secretary-General is commissioning papers on environmental management and technology transfer in some developing countries including Brazil, China and Thailand. The papers will address case studies in selected areas focusing on the issue of locally developed technology, the transfer and adaptation of foreign technology, technological and financial impediments faced in developing countries for sound environmental management and public experiences and proposals.

III. ISSUES FOR DISCUSSION

Overview

17. There is no universally accepted definition of "environmentally sound technologies". Environmental soundness is a relative rather than absolute term. Therefore, sometimes it might be appropriate to use the term "environmentally sounder technology", although what we mean by environmentally sound technologies itself depends on the perspective adopted (i.e. physical, natural, cultural, social, and economic dimensions) and on the meaning one attaches to "environment". In this sense environmentally sound technologies is a case-specific, area-specific matter and depends on both technical and economic realities. "Technologies" also frequently incorporate a significant element of techniques and processes.

18. Secondly, environmentally sound technologies are not just individual technologies but total systems, which include procedures, processes, products and services as well as equipment. This implies that when discussing transfer of technologies, the human resource development, training and capacity building aspects should also be addressed.

19. The discussion of the transfer of environmentally sound technologies in the context of the para 15 (m) of General Assembly resolution 44/228 4/ is really a specialized discussion within the long-standing, broader debates on the transfer of technologies to developing countries with three specific and newer foci:

(a) The concept of environmental sustainability prompts the need for environmental and/or sustainable development criteria to identify relevant technologies;

(b) General Assembly resolution 44/228 refers specifically to "effective modalities for favourable access to and transfer of environmentally sound technologies, in particular to developing countries, including on concessional and preferential terms" as also to "assured access for developing countries to environmentally sound technologies in its relation to proprietary rights".

(c) Sustainable development itself pre-supposes an access arrangement for transfer of environmentally sound technologies that includes a complete technological package, its hardware, training, skills, maintenance services, and the capacity to innovate on the technology itself.

20. The concept of environmentally sound technologies calls for a reassessment of the relationship between people and nature, and especially of the processes involved in transforming natural resources into commercial products. Such processes invariably create environmental problems. Different technologies differ in the efficiency with which they make use of natural resources, as well as in the extent to which they facilitate recycling, the toxicity and the longevity of the wastes they produce, the risk of accidents they pose and the threat they represent for current and future generations. Speeding up the spread of technologies to more countries should therefore yield world-wide benefits.

21. The creation of new technologies takes place both in the public and in the private sector. In the public domain the main task is concerned with ensuring the necessary financial means and the institutional mechanisms for delivering the relevant expertise to users and with building up capacities for absorption and effective utilization. Outside the public domain the nature of the problem is somewhat different. In areas where the gap between the social benefits from a sound environment and private profit is great, the role of the State and the international community would be to provide adequate fiscal financial support and regulatory oversight so that available environmentally sound technologies are used widely and appropriately. However, where individual enterprises can discover ways to market environmentally innovative products at a reasonable cost, there can be a constructive convergence of interests between private initiative and environmental protection.

Identification of barriers causing the under-use of environmentally sound technologies

22. Production in the developed and developing countries continues to be based substantially on older products/processes which are less than environmentally sound. One reason for this is that the introduction of new technologies depends on the rate of new investment and the lower this rate in any sector or country the slower is the process of diffusion. Furthermore, the use of environmentally sound technologies is linked to prevailing

environmental standards. There are also certain other barriers which result in the under-use of available environmentally sound technologies in the developing countries, which might include the following:

(a) Too often it is unprofitable to sell environmentally sound technologies in developing countries because of the size of the market, insufficient level of environmental requirements, lack of information, etc.

(b) It can be difficult to maintain high capital or skill intensive environmentally sound technologies in developing countries. Without the associated technological "know-how", the transfer of hard equipment can result in less than optimal use.

(c) The price set for the protection of patents can often be too high for the local market in developing countries.

(d) Costs of new environmentally sound technologies are frequently greater than existing "polluting" technologies, with insufficient financial resources to cover the incremental costs.

(e) An unfavourable bias often exists against indigenous environmentally sound technologies, especially as local conditions and needs are not always sufficiently taken into account in imported technologies.

(f) There are insufficient effective arrangements for scientific and technological information exchange to help make environmentally sound technology decisions in developing countries.

23. It is not always easy to determine which barriers are real or are merely perceived. In the latter case, it is theoretically possible to correct matters by greater information exchange between producers and potential users. However, some of these perceptions are based on historical and cultural experiences and to be eliminated need more information exchange.

24. The Preparatory Committee may wish to discuss the nature of the barriers that restrict the flow of environmentally sound technologies and the initiatives that need to be taken by corporations, national governments and international organizations to reduce these barriers.

Definition of environmentally sound technologies

25. The meaning of "transfer of technology" is subject to different interpretations. 5/ The availability of a particular technology for use exclusively in generating the intended economic value will not in itself greatly increase the overall capacity of the recipient to produce that technological asset. In its simplest form, technology transfer means the acquisition of existing technologies and related inputs to produce specific goods and services. In a more development-oriented sense, it implies that the recipients of technology will eventually be able to absorb the technological capacity that underlies the technological asset. Thus viewed, the transfer of technology contributes to diversifying the production system or improving the productivity of an economic unit. In an even wider sense, the full absorption and assimilation of technologies and the development of indigenous capacities for adaptation and innovation constitute the real test of effectiveness of the transfer process. Much of this depends on the efforts deployed by the

acquirer of the technology and it should be one of the objectives of the decision maker to ascertain whether both aspects mentioned above are comprised in a particular transfer or not, and, if not, which are the main obstacles and how they can be removed.

26. For policy purposes, three main categories of environmentally sound technologies can be identified:

(a) those related to formal conventions and international agreements with their own financing mechanisms (e.g. the technologies for replacing ozone-depleting CFCs);

(b) those related to their domestic, regional or global environmental protection issues. They are less polluting, less energy and resource intensive, and recycle more of the wastes and products they generate (e.g. technologies to prevent degradation of the air or water);

(c) those related to sustainable development of natural resources (e.g. technologies for sustainable agriculture).

27. The groups suggested above are not mutually exclusive. Thus some technologies required by an international convention may also be relevant for tackling other environmental problems. Equally certain types of pollution abatement technologies, e.g. those that focus on improved efficiency of resources, may also help in enhancing the development potential of natural resources. Hence the grouping has to be related more to the primary objective or motivation for promoting the technology than the nature of the technology itself.

28. The Preparatory Committee may wish to consider the usefulness of the above grouping and the general principles which needs to be followed in each group.

Potential new mechanisms for favourable access to and the transfer of environmentally sound technologies, particularly to developing countries

29. There are a variety of potential mechanisms for increasing the transfer of environmentally sound technologies to developing countries on favourable financial terms. As no single mechanism is going to be able to support a broad-based increase in international trade in environmentally sound technologies, it is important to consider which mix of measures might be the most effective overall.

30. As Governments, international organizations, industry, and independent research institutes are in the early stages of developing ideas for appropriate mechanisms and combinations of mechanisms, it might be useful to identify some of the more innovative proposals to date, including:

(a) devising multilateral arrangements to underwrite a proportion of the cost of transferring environmentally sound technologies to developing countries;

(b) a new focus on bilateral and multilateral development assistance, based on the integration of environmental values into social/economic decision making;

(c) encouraging the diffusion by transnational corporations at a uniform pace of the latest versions of environmentally sound technologies throughout their organizations, while increasing the research and development funds contracted locally by affiliate management;

(d) the transfer of property rights of environmentally sound technologies to an international organization to allow favourable access to developing countries for local protection;

(e) creating effective mechanisms of transferring public domain technologies and system, since a substantial portion of environmentally sound technologies are in the public domain such as waste management and public transport.

31. The Preparatory Committee may wish to consider these and other ideas for providing favourable access to environmentally sound technology, in particular to developing countries.

Determinants of the degree of concessionality or preferential treatment in the transfer of environmentally sound technologies

32. There are situations where concessional or preferential financial terms may be necessary in order to arrange for favourable access to environmentally sound technologies. However, there is no magic formula that can be used to assess/calculate the discount necessary for an environmentally sound technology. Certain principles might assist in developing a rule-of-thumb for appropriate degrees of concessionality or preferential treatment while maintaining a reasonable return to the supplier of the environmentally sound technologies. The factors which need to be taken into account could be:

(a) the extent of the discrepancy between social costs and private benefits (e.g. where costs of environmental degradation greatly exceed the short-term commercial interests);

(b) the degree of effective competition in the supply of a given technology;

(c) the type of obligation on citizens/governments (e.g. phasing out of CFCs), part of which may be counterbalanced by indirect or direct financial support; or

(d) the relative advantage of using price discounts as an inducement to alter public or corporate behaviour to obtain a social objective.

33. The Preparatory Committee may wish to consider the principles that should guide the degree of concessionality or preferential treatment.

Steps that could be taken to upgrade the acquisition of information on environmentally sound technologies

34. Upgrading the acquisition of information on the environmental aspects of technologies can be seen to having two interrelated aspects:

(a) upgrading information on existing environmentally sound technologies: as stated in the section of current activities, under UNEP's

Cleaner Production Programme, International Cleaner Production Information Clearing House (ILPIC) and other related activities are carried out with the aim of promoting transfer of information regarding environmentally sound technologies. A potential avenue for upgrading acquisition of information on environmentally sound technologies is to use more systematically the ongoing industrial trade fairs, technical journals, trade conferences, directories of products and services, collaborative research institutions and annual meeting for displaying and diffusing information on environmentally sound technologies, products and services.

(b) upgrading information on environmental risk from technologies on the international market: a number of international information systems exist to aid governments in obtaining data on risks and hazards from chemical compounds and products (e.g. IRPTC, WHO Certification Scheme for Drugs in International Trade, London Guidelines on ...). Recently certain technologies and classes of technologies have begun to have embryonic information exchange systems, for example, with regard to accident potentials and emergency response.

35. This disclosure pattern is based on the type of information generally made available in developed countries to public authorities and/or the general public during required filing of environmental impact assessments and, in the case of installations involving the potential for a significant accident, filings in compliance with other specific national laws or EC directives. While some transnational corporations and their international trade associations have articulated policy statements on the disclosure of risk information to potential clients worldwide, there is no generalized understanding of either the obligation of international firms to follow certain disclosure standards, even in the absence of formal laws or regulations in developing countries, or in the case of firms who are not parties to voluntary international trade associations agreements.

36. The Preparatory Committee may wish to consider what forms of new international information systems need to be created in order to supply potential users with appropriate information on environmental consequences of a given technology.

Exploration of the concept of assured access for developing countries to environmentally sound technologies in its relations to proprietary rights

37. While the number of environmentally sound technologies under patent protection which restrict their availability in developing countries is probably quite low, it is important to delineate the conditions that might apply for such technologies in the future. The primary rationale advanced for the importance of patent protection is to reward inventors sufficiently so that new investments are continuously made in new research and development, in this case, for new research and development for environmentally sound technologies. Where the potential market for a new product or process is principally in developed countries, exemptions or special conditions for users in developing countries may not significantly influence the investment pattern. However transnational corporations and investors within developing countries may need some form of market assurance in order to address environmental problems in developing countries. State-supported research programmes or state-encouraged (via fiscal mechanisms) research agendas can balance out some part of the costs.

38. The Preparatory Committee may wish to discuss the balance between assured access for users in developing countries to the latest environmentally sound technologies and an incentive system that promotes research and development of new environmentally sound technologies.

39. The broader issues of intellectual property rights are under discussion in other fora such as WIPO and in the Uruguay Round of GATT Negotiations. With regard to environmentally sound technologies the Preparatory Committee may wish to discuss:

(i) patentability issues regarding the environment (specifically those for living organisms);

(ii) the applicability of public interest provisions which exist in some patent legislation and the need to define explicitly the scope and coverage of an environmental public interest;

(iii) the suggestion that obligations under conventions to use patent-protected technologies may be ineffective, unless developing countries are exempted from implementation until the patent expires or other financial means are established to cover the implementation burden on developing countries.

Capacity building in recipient countries

40. Even with liberal access to environmentally sound technologies and funding, there is an urgent need to strengthen the endogenous capacities of the developing countries so that they could adopt globally consistent policies of assessment and choice of environmentally sound technologies.

41. Receptor capacity relates to the ability of the recipient country to evaluate, assess, absorb and effectively use the technology. Recipient countries need to be able to assess the implications of alternative options and the relevance of these to their local situation. This is important because recipients must be able to make an intelligent selection between technological solutions being advanced by a potentially wide range of suppliers. Transfer of expertise on assessment procedure is as vital as on the technologies themselves. Also, at a later stage, an adequate receptor capacity is important to modify and adapt a technology to particular local needs, to use it effectively in the ongoing operations, and to cope with maintenance and repairs.

42. Building-up capacity relates to both human resource base (knowledge, skills and technological literacy) and infrastructure (e.g. schools, equipment and laboratories). But the development of the human resource base goes beyond education programmes and extends to operational skills in various sectors at the micro level. It should foster the capacity for rapid technological absorption and innovative development and promote a high degree of specialized skills in engineering, design and consultancy, and should cover:

- scientists and research workers in applied areas;
- specialists with the appropriate skills for technology and management, both in institution and enterprises; and
- policy formulation and implementation function.

43. Developing the technological infrastructure involves various elements, including the collection, analysis and dissemination of technological information and the development of local capabilities in technological services.

44. In each technology transfer situation, it is common to have to enhance through training the technical capacity of the receptor, either before or concurrently with the transfer. This will involve training. Effective modalities of such training need to be considered.

45. The Preparatory Committee may wish to consider ways and means to promote building up capacities in recipient countries.

Notes

1/ In particular those of paragraph 15 (m) of Section I which asked the Conference:

> to examine with a view to recommending effective modalities for favourable access to, and transfer of, environmentally sound technologies, in particular to developing countries, including on concessional and preferential terms, and for supporting all countries in their efforts to create and develop their endogenous technological capacities in scientific research and development, as well as in the acquisition of relevant information, and, in this context, to explore the concept of assured access for developing countries to environmentally sound technologies in its relation to proprietary rights with a view to developing effective responses to the needs of developing countries in this area.

(Report of the Preparatory Committee for the United Nations Conference on Environment and Development Official Record of the General Assembly, A/45/46, decision 1/29).

2/ The study would:

(a) Elucidate the concept of environmentally sound technology and clarify the process by which such technology is transferred;

(b) Examine the technological needs of developing countries;

(c) Examine the needs of developing countries for training of their personnel in order to enable those countries to adapt and accept the transfer of environmentally sound technology;

(d) Examine the obstacles, on both the exporting and importing sides, that impede the transfer of environmentally sound technology;

(e) Examine the adequacy of existing modalities and programmes for the transfer of environmentally sound technology;

(f) Examine what new mechanisms are needed and their financial implication;

(g) Provide examples of case-studies of success and failure;

(h) Examine the potential for regional and subregional co-operation;

(i) Review the implications for this issue of the outcome of the Uruguay Round of multilateral trade negotiations.

(Report of the Preparatory Committee for the United Nations Conference on Environment and Development Official Record of the General Assembly, A/45/46, decision 1/8).

3/ The report here is based on information available to the Secretary-General. It will be supplemented and updated in the future.

4/ See footnote 1/.

5/ See "Transfer and Development of Technology in Developing Countries: a compendium of policy issues". UNCTAD, 1990.